Dear colleagues,
May I make a suggestion for avoiding getting sucked into fruitless and unproductive discussions with unknowledgeable media people or "knowledgeable experts"? Why quibble about estimated and several times admittedly wrong Japanese dose values, or questions about how bad the Fukushima expected long-term health effects will eventually be relative to TMI or Chernobyl? Or challenge the meaning of "standards", i.e. what doses of radiation are "really" bad for your health?
Instead, you could bring to the attention of your audience one of several examples of recent studies (add your own additional examples) that illustrate the *gaping discrepancy between observations (reality) and highly flawed and outdated theoretical notions, called our "current state of radiation health science".*

1. After the accident at the TMI plant, the official Columbia U. study found no increased health effects, consistent with the officially estimated population doses and the "appropriate" internationally accepted radiation risk factors. In contrast, a subsequent study by Wing et al did find statistically significant excess cancers. These cancers affected the lives of real and documented persons, not numbers predicted by some risk model. Yet, Wing's results were angrily dismissed by the radiation establishment because current radiobiological science precluded that officially declared levels of emitted radioactivity from the TMI reactor could induce the observed excess cancers at such "low doses."
Following a tradition illustrated by Gallileo's fate, accepted theory, models and vested interests trumped reality and/or observation.

2. All over the former Soviet Union increased incidence of cancers and a multiplicity of other serious health detriments, associated with the levels of severity of radioactive fallout from the Chernobyl disaster, have been documented, sometimes with smaller, sometimes with larger uncertainty limits. All of these studies, however, with a few notable exceptions, could only be published in Russian scientific/medical journals, allowing the Western radiation health establishment to deliberately ignore it all. Instead, the nuclear technology promoting UN agency IAEA (the WHO is not permitted to conduct independent studies on radiation health) published report after report with estimated numbers of Chernobyl radiation victims that are several orders of magnitude smaller than observed and documented numbers presented by Yablokov et al. in the recently published compendium of many of these data in English (Yablokov et al., Annals of the NY Academy of Sciences, 2009). The official UN scientific committee UNSCEAR supported the IAEA

assersions, purportedly based on the world's most reliable current radiobiological and radiation risk models. Current "state-of-the art" mainstream radiation health science proclaims that the observed numbers of radiation-associated victims of the Chernobyl catastrophy must be the result of psychosomatic effects, since they cannot be caused by radiation.
In far away Western European countries where UNSCEAR estimated very low fallout doses, a multitude of excess health effects, such as neo-natal mortality, Down's syndrome, lowering of child IQ were observed after Chernobyl. Official doses and current radiobiological science precludes any plausible relationship of Chernobyl fallout with these significant and documented observations. Even psychosomatic theories don't work here.
Yet, theory, models and powerful vested interests again trump reality and observation.

3. The German government commissioned a team of prestigious government-employed health scientists to design a state-of-the-art study of children <5 years who lived in the proximity of any of the 16 German nuclear power reactors. The unarticulated aim of the study was to assuage continued citizens' concerns about childhood leukemia clusters they observed around some specific reactors. To my knowledge, it is the only government-sponsored radiation study ever that was designed with full input and oversight of an independent scientific commission, including several members who had publicly supported the citizens' concerns. For these <5 years children the government scientists found irrefutable evidence for an association between a more than doubling of risk to contract leukemia or other cancers and living within 10 km of any of these reactors. This association caused quite a stir in Germany (and remains effectively unacknowledged in this country) but it could not be credibly refuted. Desperate for an "out," the government researchers, the appropriate health agencies and their political funders then declared these excess cases of leukemia and cancer as currently inexplicable since mainstream radiobiological science precludes these malignancies to be induced by the "very low levels" of radioactive emissions from normally operating reactors. These emissions, as estimated by the reactor operators, are purportedly at least three orders of magnitude too low for any health effects to be observable . However, in addition to obvious flaws in the full accounting of radioactive emissions, these models neglect environmental pathways to incorporated radioisotopes and the very large radio-sensitivity of the developing fetus and young children (Fairlie, J Environ Science Health, 2010). Accepted

radiobiological knowledge has yet to incorporate many well-documented, highly complex inter-cellular or molecular interactions. Add to this that the macroscopic concepts of "absorbed dose" are totally inadequate for characterizing microscopic radiation effects, stimulated by diverse radioactive emissions at greatly varying energy levels, originating in living tissue.

In summary, since facts (observations) cannot be changed, why not update our theories and models?

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